REPORT ON THE CERTIFICATION TESTING OF A
BLACKROC TECHNOLOGY LTD
RFID MODULE
WITH RESPECT TO
THE FCC RULES CFR 47, PART 15.225 September 2007
INTENTIONAL RADIATOR SPECIFICATION

TEST REPORT NO: RU1325/8271

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FCC ID: S3318000-3M2

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BLACKROC TECHNOLOGY LTD
RFID MODULE
WITH RESPECT TO
THE FCC RULES CFR 47, PART 15.225 September 2007
INTENTIONAL RADIATOR SPECIFICATION

TEST DATE: 16th November – 4th December 2007

TESTED BY: Daniel Winstanley — Digitally signed by Daniel Winstanley DN: CN = Daniel Winstanley, C = <n Reason: I am the author of this document Date: 2008.01.15 09:29:09 Z — D WINSTANLEY

APPROVED BY: John Charters — Digitally signed by John Charters DN: CN = John Charters, C = GB, O = TRL Compliance Ltd Reason: I am approving this document Date: 2008.01.28 10:34:48 Z — J CHARTERS RADIO SECTION LEADER

DATE: 15th January 2008

Distribution:

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CONTENTS

Notes:

1. Component failure during test — YES [ ] NO [X]
2. If Yes, details of failure:
3. The facilities used for the testing of the product contain in this report are FCC Listed.
4. The contents of the attached applicants declarations and other supplied information are not covered by the scope of this laboratory's UKAS or FCC accreditations' and is provided in good faith.

FCC IDENTITY:	S3318000-3M2
PURPOSE OF TEST:	Certification
TEST SPECIFICATION:	FCC RULES CFR 47, Part 15.225 September 2007
TEST RESULT:	Compliant to Specification
EQUIPMENT UNDER TEST:	RFID Module
EQUIPMENT TYPE:	Inductive Reader
PRODUCT USE:	RFID
CARRIER EMISSION:	89.33 µV/m @ 30m
ANTENNA TYPE:	Attached Loop (61mm x 45mm)
ALTERNATIVE ANTENNA:	Remote Loop (61mm x 45mm) Larger Remote Loop (81mm x 54mm)
FREQUENCY OF OPERATION:	13.56 MHz
CHANNEL SPACING:	Not Applicable
NUMBER OF CHANNELS:	1
FREQUENCY GENERATION:	SAW Resonator [ ] Crystal [X] Synthesiser [ ]
MODULATION METHOD:	Amplitude [ ] Digital [ ] Angle [X]
POWER SOURCE(s):	+5Vdc
TEST DATE(s):	16th November – 4th December 2007
ORDER No(s):	POR00829
APPLICANT:	Blackroc Technology Ltd
ADDRESS:	Units 7 & 8 Parker Court Staffordshire Technology Park Stafford ST18 0WP

TESTED BY: Daniel Winstanley — Digitally signed by Daniel Winstanley DN: CN = Daniel Winstanley, C = <n Reason: I am the author of this document Date: 2008.01.15 09:28:58 Z — D WINSTANLEY

APPROVED BY: John Charters — Digitally signed by John Charters DN: CN = John Charters, C = GB, O = TRL Compliance Ltd Reason: I am approving this document Date: 2008.01.28 10:34:58 Z — J CHARTERS RADIO SECTION LEADER

APPLICANT'S SUMMARY

EQUIPMENT UNDER TEST (EUT):	RFID Module
EQUIPMENT TYPE:	Inductive Reader
PURPOSE OF TEST:	Certification
TEST SPECIFICATION(s):	FCC RULES CFR 47, Part 15.225 September 2007
TEST RESULT:	COMPLIANT Yes [X] No [ ]
APPLICANT'S CATEGORY:	MANUFACTURER [X] IMPORTER [ ] DISTRIBUTOR [ ] TEST HOUSE [ ] AGENT [ ]
APPLICANT'S ORDER No(s):	POR00829
APPLICANT'S CONTACT PERSON(s):	Mr G Price
E-mail address:	gary-price@blackroc.com
APPLICANT:	Blackroc Technology Ltd
ADDRESS:	Units 7 & 8 Parker Court Staffordshire Technology Park Stafford ST18 0WP
TEL:	+44 (0) 1785 218500
FAX:	+44 (0) 1785 218501
EUT(s) COUNTRY OF ORIGIN:	United Kingdom
TEST LABORATORY:	TRL Compliance Ltd
UKAS ACCREDITATION No:	0728
TEST DATE(s):	16th November – 4th December 2007
TEST REPORT No:	RU1325/8271

EQUIPMENT TEST / EXAMINATIONS REQUIRED

1.

TEST/EXAMINATION	RULE PART	DETECTOR	APPLICABILITY
Intentional Emission Frequency:	15.225(a)	Quasi-Peak	Yes
Intentional Emission Field Strength:	15.225(a)	Quasi-Peak	Yes
Intentional Emission Band Occupancy:	12.255(e)	Peak	Yes
Intentional Emission ERP (mW):	-	-	No
Spurious Emissions – Conducted:	15.207	Quasi-Peak Average	Yes
Spurious Emissions – Radiated <1000MHz:	15.209	Quasi-Peak	Yes
Spurious Emissions – Radiated >1000MHz:	15.209	Average	Yes
Maximum Frequency of Search:	15.33	-	Yes
Antenna Arrangements Integral:	15.203	-	Yes
Antenna Arrangements External Connector:	15.204	-	Yes
Restricted Bands:	15.205	-	Yes
Extrapolation Factor:	15.31(f)	-	Yes

2. Product Use: RFID

3. Duty Cycle: <100 %

4. Maximum transmitter bit or pulse rate and level: 423.75bps

5. Temperatures: Ambient (Tnom) $7^{o}C$

6. Supply Voltages: Vnom +5Vdc

Note: Vnom voltages are as stated above unless otherwise shown on the test report page

7. Equipment Category:
   Single channel [X]
   Two channel [ ]
   Multi-channel [ ]

8. Channel spacing:
   Narrowband [ ]
   Wideband [X]

TRANSMITTER TESTS

TRANSMITTER SPURIOUS EMISSIONS – RADIATED – PART 15.209

Ambient temperature	=	8^{o}C(<1GHz)	3m measurements <1GHz	[X]
Relative humidity	=	84% (<1GHz),	10m measurements <30MHz	[X]
Conditions	=	Open Area Test Site (OATS)	30m extrapolated from 10m	[X]
Supply voltage	=	+5Vdc		
Channel number	=	1		

Attached Antenna (61mm x 45mm)	**FREQ. (MHz)**	**MEAS. Rx. (dBµV)**	**CABLE LOSS (dB)**	**ANT FACT. (dB/m)**	**FIELD STRENGTH (dBµV/m)**	**EXTRAP. FACTOR (dB)**	**FIELD STRENGTH (µV/m)**	**LIMIT (µV/m)**
0.009MHz - 0.490MHz							Note 9	
0.490MHz - 1.750MHz							Note 9	
1.705MHz - 30.0MHz	27.12	9.4	-	20	29.4	19.08	3.28	30
30MHz - 88MHz	40.7	16.61	0.99	12.2	29.8	-	30.90	100
88MHz - 216MHz							Note 9	
216MHz - 960MHz	339.02 352.58 366.10	12.74 10.04 14.25	2.46 2.50 2.55	14.30 14.46 14.50	29.5 27.0 31.3	- - -	29.85 22.38 36.73	200 200 200
960MHz - 1GHz							Note 9	
1GHz - 5GHz							Note 9	

Limits	0.009MHz to 0.490MHz	2400/F(kHz) @ 300m
	0.490MHz to 1.705MHz	24000/F(kHz) @ 30m
	1.705MHz to 30MHz	30µV/m @ 30m
	30MHz to 88MHz	100µV/m @ 3m
	88MHz to 216MHz	150µV/m @ 3m
	216MHz to 960MHz	200µV/m @ 3m
	960MHz to 1GHz	500µV/m @ 3m
	1GHz to 5GHz	500µV/m @ 3m

See page 10 for notes and test method:

Remote Antenna (61mm x 45mm)	FREQ. (MHz)	MEAS. Rx. (dBµV)	CABLE LOSS (dB)	ANT FACT. (dB/m)	FIELD STRENGTH (dBµV/m)	EXTRAP. FACTOR (dB)	FIELD STRENGTH (µV/m)	LIMIT (µV/m)
0.009MHz - 0.490MHz							Note 9	
0.490MHz - 1.750MHz							Note 9	
1.705MHz - 30.0MHz							Note 9	
30MHz - 88MHz	40.7 81.4	20.41 14.18	0.99 1.32	12.2 7.30	33.6 22.8	- -	47.86 13.80	100 100
88MHz - 216MHz	108.50 135.60 173.60 189.85	16.83 10.88 19.58 20.80	1.47 1.62 1.82 1.90	10.70 11.50 9.00 8.10	29.0 24.0 30.4 30.8	- - - -	28.18 15.85 33.11 34.67	150 150 150 150
216MHz - 960MHz	339.02 352.58 366.10	22.64 15.34 19.95	2.46 2.50 2.55	14.30 14.46 14.50	39.4 32.3 37.0	- - -	93.32 41.20 70.79	200 200 200
960MHz - 1GHz							Note 9	
1GHz - 5GHz							Note 9	

Limits	
0.009MHz to 0.490MHz	2400/F(kHz) @ 300m
0.490MHz to 1.705MHz	24000/F(kHz) @ 30m
1.705MHz to 30MHz	30µV/m @ 30m
30MHz to 88MHz	100µV/m @ 3m
88MHz to 216MHz	150µV/m @ 3m
216MHz to 960MHz	200µV/m @ 3m
960MHz to 1GHz	500µV/m @ 3m
1GHz to 5GHz	500µV/m @ 3m

See page 10 for notes and test method:

Larger Remote Antenna (81mm x 54mm)	FREQ. (MHz)	MEAS. Rx. (dBµV)	CABLE LOSS (dB)	ANT FACT. (dB/m)	FIELD STRENGTH (dBµV/m)	EXTRAP. FACTOR (dB)	FIELD STRENGTH (µV/m)	LIMIT (µV/m)
0.009MHz - 0.490MHz							Note 9	
0.490MHz - 1.750MHz							Note 9	
1.705MHz - 30.0MHz	27.12	11.1	-	20	31.1	19.08	3.99	30
30MHz - 88MHz							Note 9	
88MHz - 216MHz							Note 9	
216MHz - 960MHz							Note 9	
960MHz - 1GHz							Note 9	
1GHz - 5GHz							Note 9	

Limits	0.009MHz to 0.490MHz	2400/F(kHz) @ 300m
	0.490MHz to 1.705MHz	24000/F(kHz) @ 30m
	1.705MHz to 30MHz	30µV/m @ 30m
	30MHz to 88MHz	100µV/m @ 3m
	88MHz to 216MHz	150µV/m @ 3m
	216MHz to 960MHz	200µV/m @ 3m
	960MHz to 1GHz	500µV/m @ 3m
	1GHz to 5GHz	500µV/m @ 3m

See next page for notes and test method:

Notes:

1 Results quoted are extrapolated as indicated
2 Emissions were searched to: (**x**) 1000MHz inclusive, as per Part 15.33a
3 Extrapolation factor from 10m to 30m, as per Part 15.31f
4 Measurements >1GHz @ 1m as per Part 15.31f(1)
5 Receiver detector >1GHz = CISPR, Quasi-Peak, 120kHz bandwidth
6 Receiver detector >1GHz = Peak Hold, 1MHz resolution bandwidth
7 New batteries used for battery powered products.
8 Emissions 20 dB's below the limit were not necessarily recorded.
For emissions below 30MHz the measuring receiver automatically compensates for the loss due to the antenna factor of the loop antenna. This loss is 20 dB's across the
9 measurement range 9kHz to 30MHz.
10 For emissions below 30MHz the cable losses are assumed to be negligible.

Test Method:

1 As per Radio – Noise Emissions, ANSI C63.4: 2003
2 Measuring distances as Notes 1 to 4 above
3 EUT 0.8 metre above ground plane
4 Emissions maximised by rotation of EUT, on an automatic turntable.
Raising and lowering the receiver antenna between 1m & 4m.
Horizontal and vertical polarisations, of the receive antenna.
EUT orientation in three orthagonal planes.
Maximum results recorded.

The test equipment used for the Transmitter Spurious Emissions – Radiated – Part 15.209 tests is shown Below:

TYPE OF EQUIPMENT	MAKER/ SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
AE, LOOP, Z2, 9kHz - 30MHz	ROHDE & SCHWARZ	HFH2	881058 - 53	07	**X**
RECEIVER	ROHDE & SCHWARZ	ESHS 10	841429/012	UH187	**X**
RECEIVER	ROHDE & SCHWARZ	ESVS 10	825892/003	UH04	**X**
RANGE 1	TRL	3 METRE	N/A	UH06	**X**
RANGE 1	TRL	10 METRE	N/A	UH07	**X**
BILOG ANTENNA	YORK	CBL611/A	1618	UH191	**X**

TRANSMITTER TESTS

TRANSMITTER INTENTIONAL EMISSION – RADIATED – Part 15.225

Ambient temperature	=	7°C(<1GHz),	3m measurements @ fc	[X]
Relative humidity	=	66%(<1GHz),	10m measurements @ fc	[X]
Conditions	=	Open Area Test Site (OATS)	30m measurements @ fc	[ ]
Supply voltage	=	+5Vdc	30m extrapolated from 3m	[X]
Channel number	=	1	30m extrapolated from 10m	[X]

Attached Antenna (61mm x 45mm)

FREQ. (MHz)	MEASUREMENT DISTANCE Meters	MEASUREMENT Rx. READING (dBµV/m)	EXTRAP. FACTOR (dB)	FIELD STRENGTH (µV/m)
13.56	3	66.4	29.58	69.34
13.56	10	55.9	19.08	69.34
Limit value @ fc		**15,848(µV/m)**		

Remote Antenna (61mm x 45mm)

FREQ. (MHz)	MEASUREMENT DISTANCE Meters	MEASUREMENT Rx. READING (dBµV/m)	EXTRAP. FACTOR (dB)	FIELD STRENGTH (µV/m)
13.56	3	69.0	29.98	89.33
13.56	10	58.1	19.08	89.33
Limit value @ fc		**15,848(µV/m)**		

Large Remote Antenna (81mm x 54mm)

FREQ. (MHz)	MEASUREMENT DISTANCE Meters	MEASUREMENT Rx. READING (dBµV/m)	EXTRAP. FACTOR (dB)	FIELD STRENGTH (µV/m)
13.56	3	70.3	31.28	89.33
13.56	10	58.1	19.08	89.33
Limit value @ fc		**15,848(µV/m)**		

	f lower	**f higher**
Band occupancy @ -20dBc	13.55672 MHz	13.56398 MHz
	7.26kHz	

See Annex F for band occupancy & mask compliance plots

Notes:

1 Results quoted are extrapolated as indicated
2 The 3m – 10m extrapolation factor is calculated from the previous results. Extrapolation factor 10m – 30m is 19.08dB using the extrapolation factor of 40dB/decade as per 15.31(f)
2 Receiver detector @ fc = Quasi Peak 10kHz bandwidth
3 When battery powered the EUT was powered with new batteries
5 For emissions below 30MHz the measuring receiver automatically compensates for the loss due to the antenna factor of the loop antenna. This loss is 20 dB's across the measurement range 9kHz to 30MHz.
6 The results quoted are the maximum seen after the supply voltage was varied between 85% and 115%.
7 For emissions below 30MHz the cable losses are assumed to be negligible.

Test Method:

1 As per Radio – Noise Emissions, ANSI C63.4: 2003
2 Measuring distances 3m
3 EUT 0.8 metre above ground plane
4 Emissions maximised by rotation of EUT, on an automatic turntable.
Raising and lowering the receiver antenna between 1m & 4m.
Horizontal and vertical polarisations, of the receive antenna.
EUT orientation in three orthagonal planes.
Maximum results recorded

The test equipment used for the Transmitter Intentional Emission – Radiated – Part 15.225 tests is shown below:

TYPE OF EQUIPMENT	MAKER/ SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
AE, LOOP, Z2, 9kHz - 30MHz	ROHDE & SCHWARZ	HFH2	881058 - 53	07	**X**
RECEIVER	ROHDE & SCHWARZ	ESHS 10	841429/012	UH187	**X**
RANGE 1	TRL	3 METRE	N/A	UH06	**X**
RANGE 1	TRL	10 METRE	N/A	UH07	**X**

TRANSMITTER TESTS

TRANSMITTER CONDUCTED EMISSIONS – AC POWER LINE Part 15.207

Ambient temperature	=	20^{o}C(<1GHz),
Relative humidity	=	55%(<1GHz),
Conditions	=	Power Line Laboratory
Supply voltage	=	110V AC
Supply Frequency	=	60Hz

SIGNIFICANT EMISSIONS – ATTACHED ANTENNA (61mm x 45mm)

FREQUENCY (MHz)	MEASUREMENT RECEIVER READING (dBµV)	DETECTOR	CONDUCTOR (L or N)	LIMIT (dBµV)
10.85	31.64	Average	Live	50.00
13.56	76.50*	Average	Live	50.00
27.12	40.61	Average	Neutral	50.00

Note: *Fundament frequency measured with load attached as per TCB training notes
See results below.

SIGNIFICANT EMISSIONS – REMOTE ANTENNA (61mm x 45mm)

FREQUENCY (MHz)	MEASUREMENT RECEIVER READING (dBµV)	DETECTOR	CONDUCTOR (L or N)	LIMIT (dBµV)
13.56	81.12*	Average	Live	50.00
27.12	45.87	Average	Live	50.00

Note: *Fundament frequency measured with load attached as per TCB training notes
See results below.

SIGNIFICANT EMISSIONS – LARGE REMOTE ANTENNA (81mm x 54mm)

FREQUENCY (MHz)	MEASUREMENT RECEIVER READING (dBµV)	DETECTOR	CONDUCTOR (L or N)	LIMIT (dBµV)
10.85	32.07	Average	Live	50.00
13.56	79.81*	Average	Live	50.00
16.27	33.08	Average	Neutral	50.00
27.12	44.76	Average	Live	50.00

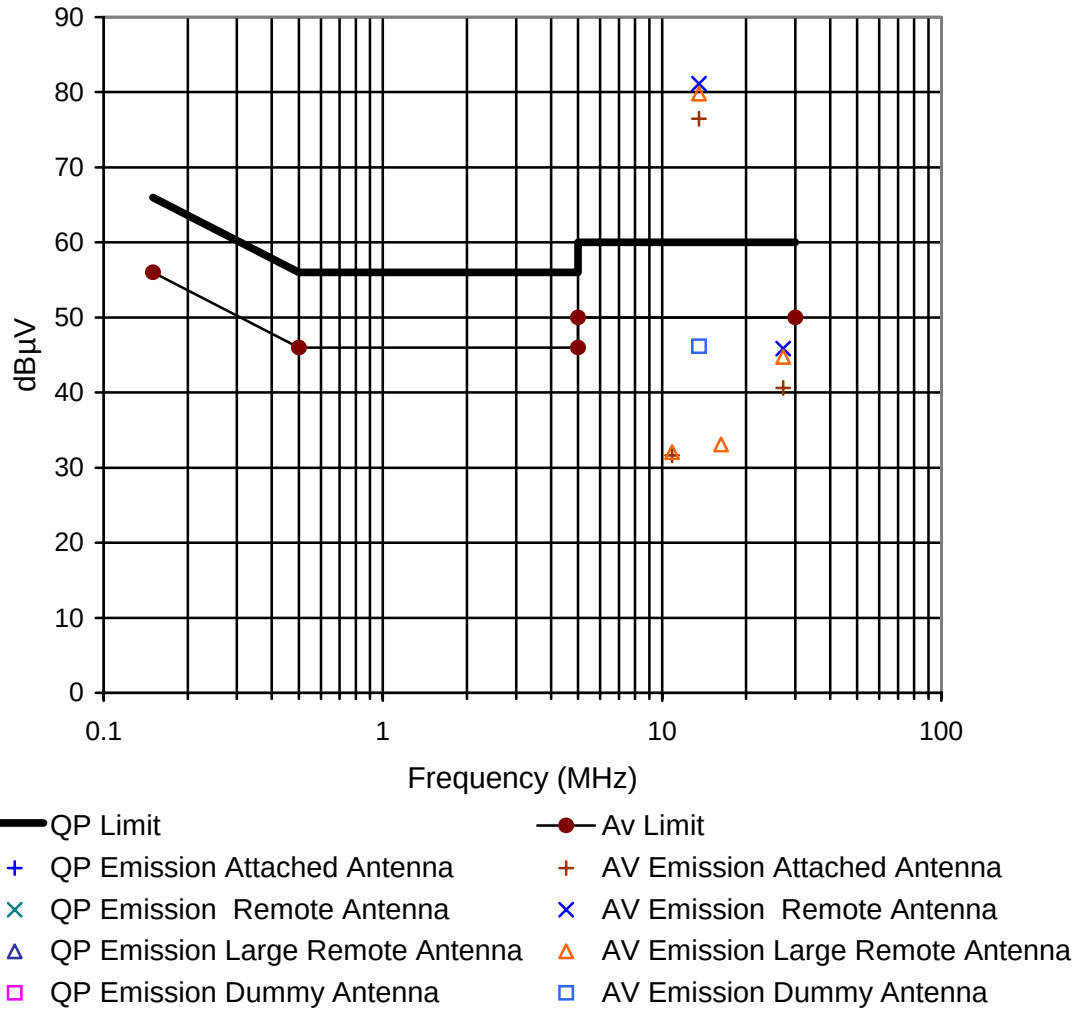
Note: *Fundament frequency measured with load attached as per TCB training notes
See results below.

SIGNIFICANT EMISSIONS - LOAD

FREQUENCY (MHz)	MEASUREMENT RECEIVER READING (dBµV)	DETECTOR	CONDUCTOR (L or N)	LIMIT (dBµV)
13.56	46.17	Average	Live	50.00

Note: *Fundament frequency measured with load attached as per TCB training notes

Limits Part 15.207
(Levels below the limit are only displayed if
within 20dB of the limit)



Notes:
1 See attached plot
2 EUT fundamental frequency measured with load replacing antenna as per TCB training notes May 05.

Test Method:
1 As per Radio – Noise Emissions, ANSI C63.4: 2003
2 * Dummy antenna fitted as per

The test equipment used for the Transmitter Conducted Emissions – AC Power Line Part 15.207 test was:

TYPE OF EQUIPMENT	MAKER/ SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
RECEIVER	ROHDE & SCHWARZ	ESHS 10	830051/001	UH03	**X**
LISN/AMN	ROHDE & SCHWARZ	ESH3-Z5.813.5	8407 31/015	UH195	**X**

ANNEX A

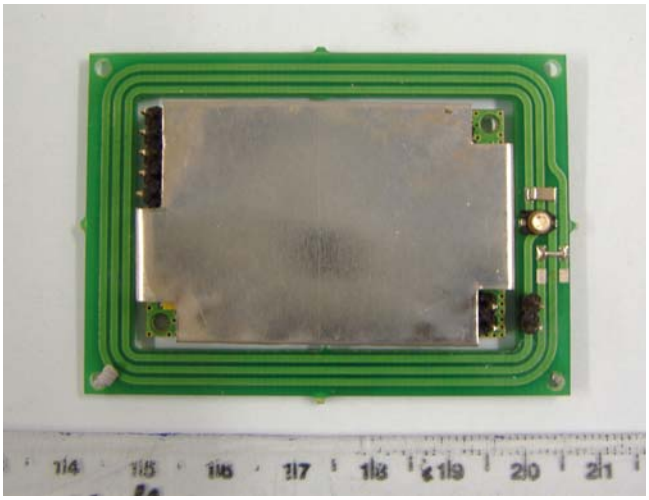
PHOTOGRAPHS

PHOTOGRAPH No. 1 **H-FIELD TEST SETUP**

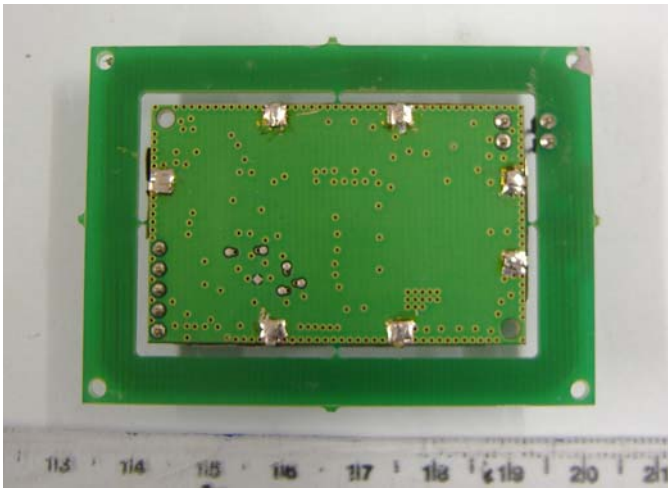
PHOTOGRAPH No. 2 **AC POWERLINE CONDUCTION ANTENNA ATTACHED**

PHOTOGRAPH No. 3 **AC POWERLINE CONDUCTION**
DUMMY LOAD ATTACHED

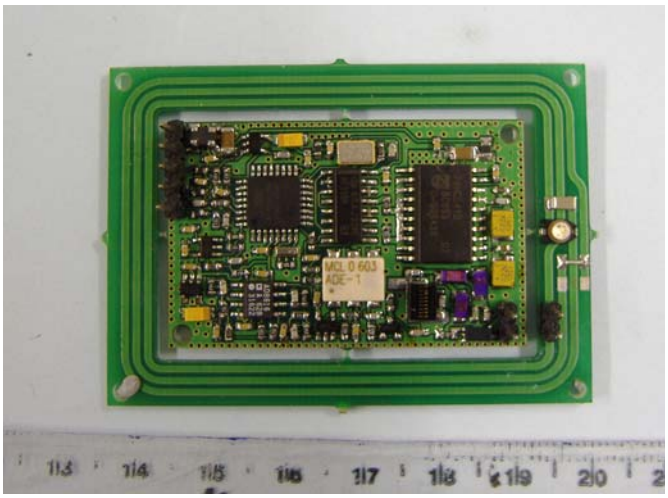
PHOTOGRAPH No. 4 **EUT WITH CAN & ATTACHED ANTENNA**



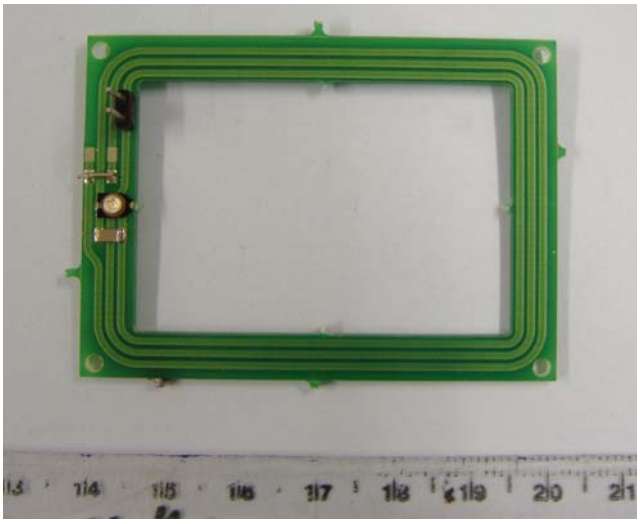
PHOTOGRAPH No. 5 **TRACK SIDE OF PCB**



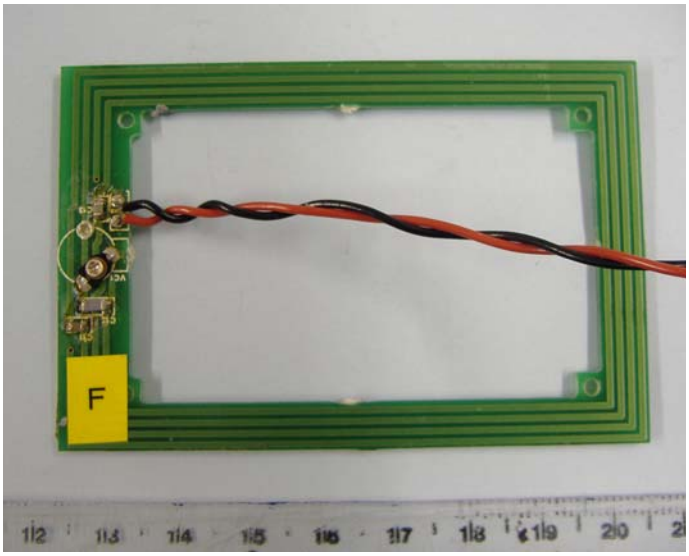
PHOTOGRAPH No. 6 **COMPONENT SIDE OF PCB**



PHOTOGRAPH No. 7 **REMOTE ANTENNA**



PHOTOGRAPH No. 8 **LARGER REMOTE ANTENNA**



ANNEX B

APPLICANT'S SUBMISSION OF DOCUMENTATION LIST

APPLICANT'S SUBMISSION OF DOCUMENTATION LIST

a.	TCB	-	APPLICATION	[X]
		-	FEE	[X]
b.	AGENT'S LETTER OF AUTHORISATION	-		[X]
c.	MODEL(s) vs IDENTITY	-		[ ]
d.	ALTERNATIVE TRADE NAME DECLARATION(s)	-		[ ]
e.	LABELLING	-	PHOTOGRAPHS	[X]
		-	DECLARATION	[ ]
		-	DRAWINGS	[ ]
f.	TECHNICAL DESCRIPTION	-		[X]
g.	BLOCK DIAGRAMS	-	Tx	[X]
		-	Rx	[ ]
		-	PSU	[ ]
		-	AUX	[ ]
h.	CIRCUIT DIAGRAMS	-	Tx	[X]
		-	Rx	[ ]
		-	PSU	[ ]
		-	AUX	[ ]
i.	COMPONENT LOCATION	-	Tx	[X]
		-	Rx	[ ]
		-	PSU	[ ]
		-	AUX	[ ]
j.	PCB TRACK LAYOUT	-	Tx	[X]
		-	Rx	[ ]
		-	PSU	[ ]
		-	AUX	[ ]
k.	BILL OF MATERIALS	-	Tx	[X]
		-	Rx	[ ]
		-	PSU	[ ]
		-	AUX	[ ]
l.	USER INSTALLATION / OPERATING INSTRUCTIONS	-		[X]

ANNEX C

MEASUREMENT UNCERTAINTY

Radio Testing – General Uncertainty Schedule

All statements of uncertainty are expanded standard uncertainty using a coverage factor of 1.96 to give a 95% confidence where no required test level exists.

[1] Adjacent Channel Power

Uncertainty in test result = **1.86dB**

[2] Carrier Power

Uncertainty in test result (Equipment - TRLUH120) = **2.18dB**
Uncertainty in test result (Equipment – TRL05) = **1.08dB**
Uncertainty in test result (Equipment – TRL479) = **2.48dB**

[3] Effective Radiated Power

Uncertainty in test result = **4.71dB**

[4] Spurious Emissions

Uncertainty in test result = **4.75dB**

[5] Maximum frequency error

Uncertainty in test result (Equipment - TRLUH120) = **119ppm**
Uncertainty in test result (Equipment – TRL05) = **0.113ppm**
Uncertainty in test result (Equipment – TRL479) = **0.265ppm**

[6] Radiated Emissions, field strength OATS 14kHz-18GHz Electric Field

Uncertainty in test result (14kHz – 30MHz) = **4.8dB**, Uncertainty in test result (30MHz – 1GHz) = **4.6dB**, Uncertainty in test result (1GHz-18GHz) = **4.7dB**

[7] Frequency deviation

Uncertainty in test result = **3.2%**

[8] Magnetic Field Emissions

Uncertainty in test result = **2.3dB**

[9] Conducted Spurious

Uncertainty in test result (Equipment TRL479) Up to 8.1GHz = **3.31dB**
Uncertainty in test result (Equipment TRL479) 8.1GHz – 15.3GHz = **4.43dB**
Uncertainty in test result (Equipment TRL479) 15.3GHz – 21GHz = **5.34dB**
Uncertainty in test result (Equipment TRLUH120) Up to 26GHz = **3.14dB**

[10] Channel Bandwidth

Uncertainty in test result = **15.5%**

[11] Amplitude and Time Measurement – Oscilloscope

Uncertainty in overall test level = **2.1dB**, Uncertainty in time measurement = **0.59%,** Uncertainty in Amplitude measurement = **0.82%**

[11] Power Line Conduction

Uncertainty in test result = **3.4dB**

[12] Spectrum Mask Measurements

Uncertainty in test result = **2.59% (frequency)**
Uncertainty in test result = **1.32dB (amplitude)**

[13] Adjacent Sub Band Selectivity

Uncertainty in test result = **1.24dB**

[14] Receiver Blocking – Listen Mode, Radiated

Uncertainty in test result = **3.42dB**

[15] Receiver Blocking – Talk Mode, Radiated

Uncertainty in test result = **3.36dB**

[16] Receiver Blocking – Talk Mode, Conducted

Uncertainty in test result = **1.24dB**

[17] Receiver Threshold

Uncertainty in test result = **3.23dB**

[18] Transmission Time Measurement

Uncertainty in test result = **7.98%**

ANNEX D

TEST EQUIPMENT CALIBRATION

TRL Number	Equipment Type	Manufacturer	Last Cal Calibration	Calibration Period	Due For Calibration
UH003	Receiver	R&S	24/07/2006	12	24/07/2007
UH004	Receiver	R&S	11/10/2006	12	11/10/2007
UH006	3m NSA CAL	TRL	19/01/2007	12	19/01/2008
UH007	10m NSA CAL	TRL	19/01/2007	12	19/01/2008
UH028	Log Periodic Ant	Schwarbeck	28/04/2005	24	28/04/2007
UH029	Bicone Antenna	Schwarbeck	27/04/2005	24	27/04/2007
UH041	Multimeter	AVOmeter	04/01/2007	12	04/01/2008
UH122	Oscilloscope	Tektronix	07/06/2005	24	07/06/2007
UH132	Power meter	Marconi	10/01/2007	12	10/01/2008
UH162	ERP Cable Cal	TRL	02/01/2007	12	02/01/2008
UH187	Receiver	R&S	11/10/2006	12	11/10/2007
UH191	Bilog Antenna	York	11/08/2006	24	11/08/2008
UH195	LISN	R&S	09/01/2007	12	09/01/2008
UH228	Power Sensor	Marconi	15/01/2007	12	15/01/2008
UH253	1m Cable N type	TRL	07/12/2006	12	07/12/2007
UH254	1m Cable N type	TRL	07/12/2006	12	07/12/2007
UH265	Notch filer	Telonic	11/01/2006	24	11/01/2008
UH269	1m Cable N type	TRL	07/12/2006	12	07/12/2007
UH270	1m Cable N type	TRL	07/12/2006	12	07/12/2007
UH271	1.5m Cable N type	TRL	07/12/2006	12	07/12/2007
UH272	1.5m Cable N type	TRL	07/12/2006	12	07/12/2007
UH273	2m Cable N type	TRL	07/12/2006	12	07/12/2007
UH274	2m Cable N type	TRL	07/12/2006	12	07/12/2007
UH281	Spectrum Analyser	R&S	24/07/2006	12	24/07/2007
L005	CMTA	R&S	10/01/2007	12	10/01/2008
L007	Loop Antenna	R&S	22/05/2007	24	22/05/2009
L138	1-18GHz Horn	EMCO	15/04/2005	24	15/04/2007
L139	1-18GHz Horn	EMCO	03/05/2005	24	03/05/2007
L176	Signal Generator	Marconi	01/03/2007	12	01/03/2008
L193	Bicone Antenna	Chase	12/10/2003	24	12/10/2005
L203	Log Periodic Ant	Chase	21/10/2003	24	21/10/2005
L343	CCIR Noise Filter	TRL	20/09/2006	12	20/09/2007
L426	Temperature Indicator	Fluke	09/01/2007	12	09/01/2008
L479	Analyser	Anritsu	09/01/2007	12	09/01/2008
L552	Signal Generator	Agilent	24/07/2006	12	24/07/2007

ANNEX E

EMISSIONS GRAPH(s)

TRL Compliance Ltd

20 Nov 2007 12:39

E-Field Radiation (30MHz-1GHz)

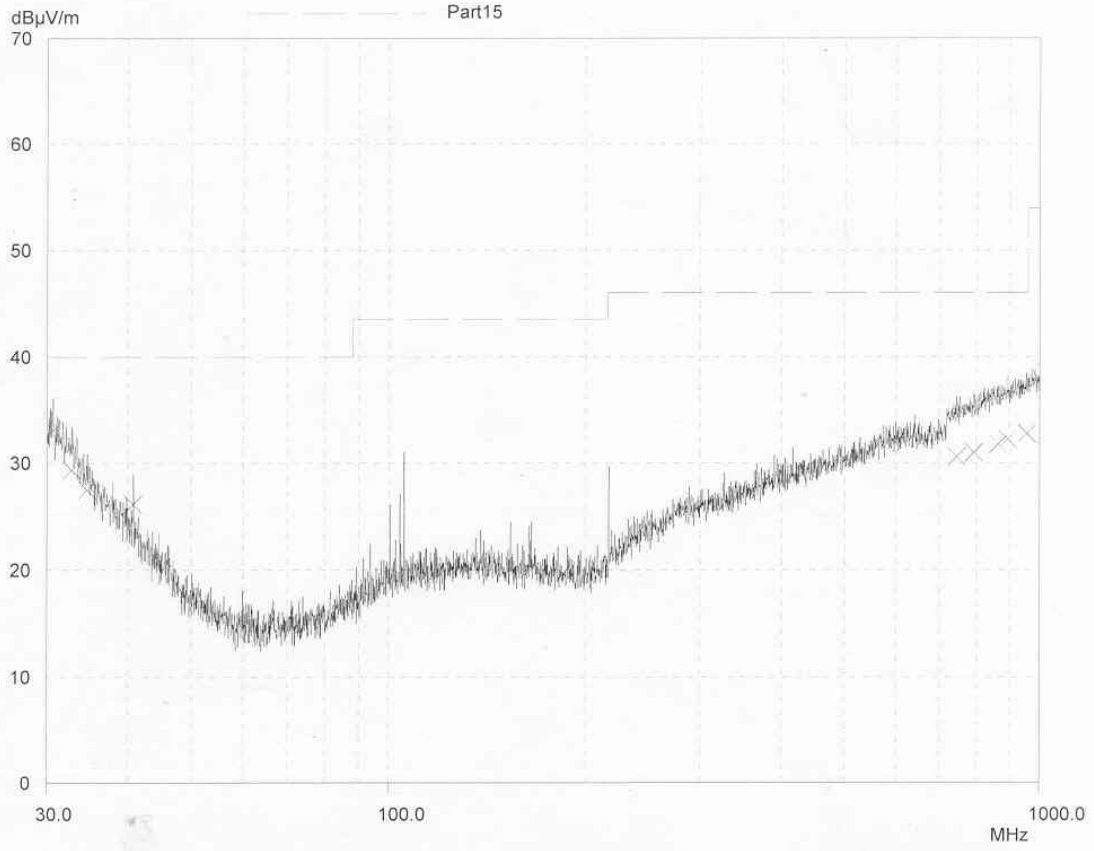
EUT:	RFID Module - Attached Antenna
Manuf:	Blackroc
Op Cond:	Prescan 30MHz - 1000MHz
Operator:	D Winstanley
Test Spec:	Part15
Comment:	EUT on Components Facing Antenna.
	RX Antenna Vertical

Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
30MHz	1000MHz	50kHz	120kHz	PK	1msec	Auto	ON	60dB

Transducer	No.	Start	Stop	Name
1	21	30MHz	1000MHz	UH72
	22	30MHz	1000MHz	UH93

Final Measurement: Detector: X QP
Meas Time: 2sec
Subranges: 50
Acc Margin: 10 dB



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TRL Compliance Ltd

20 Nov 2007 13:27

E-Field Radiation (30MHz-1GHz)

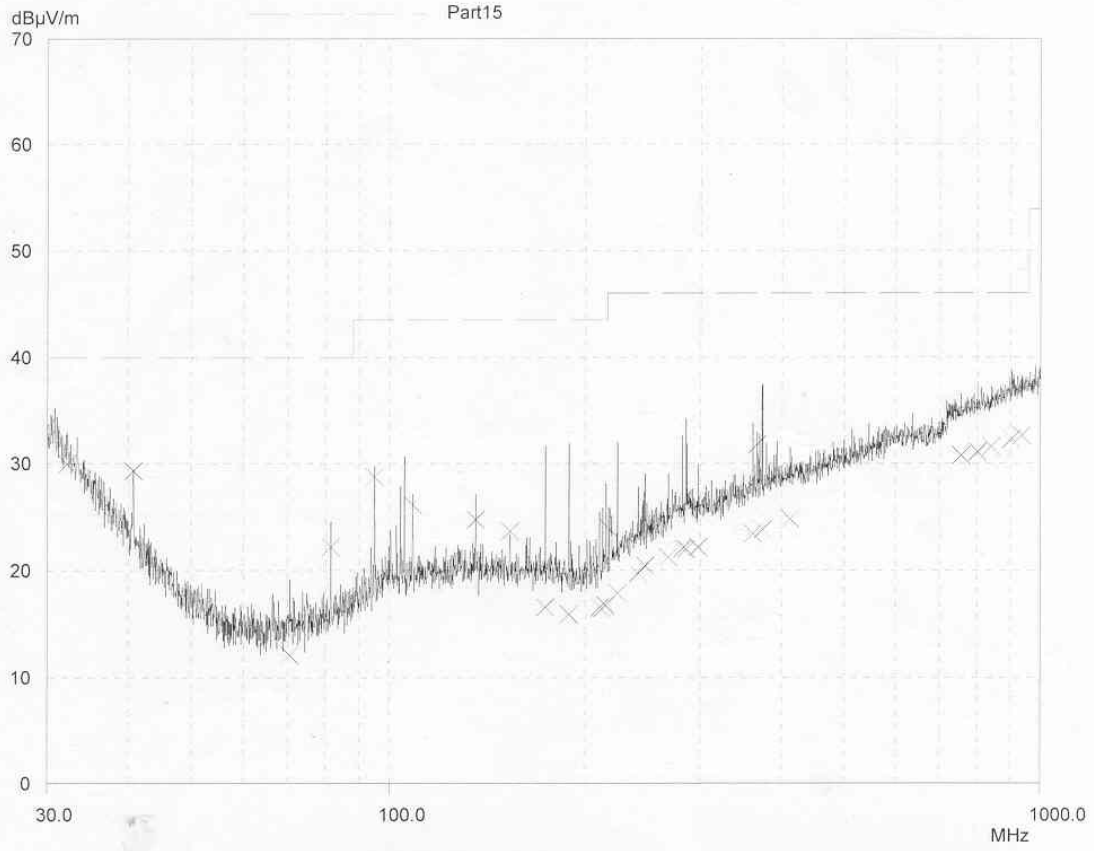
EUT:	RFID Module - Remote Antenna
Manuf:	Blackroc
Op Cond:	Prescan 30MHz - 1000MHz
Operator:	D Winstanley
Test Spec:	Part15
Comment:	EUT on Components Facing Antenna.
	RX Antenna Vertical

Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
30MHz	1000MHz	50kHz	120kHz	PK	1msec	Auto	ON	60dB

Transducer	No.	Start	Stop	Name
1	21	30MHz	1000MHz	UH72
	22	30MHz	1000MHz	UH93

Final Measurement:		
	Detector:	X QP
	Meas Time:	2sec
	Subranges:	50
	Acc Margin:	10 dB



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TRL Compliance Ltd

20 Nov 2007 12:57

E-Field Radiation (30MHz-1GHz)

EUT:	RFID Module - Large Remote Antenna
Manuf:	Blackroc
Op Cond:	Prescan 30MHz - 1000MHz
Operator:	D Winstanley
Test Spec:	Part15
Comment:	EUT on Components Facing Antenna.
	RX Antenna Vertical

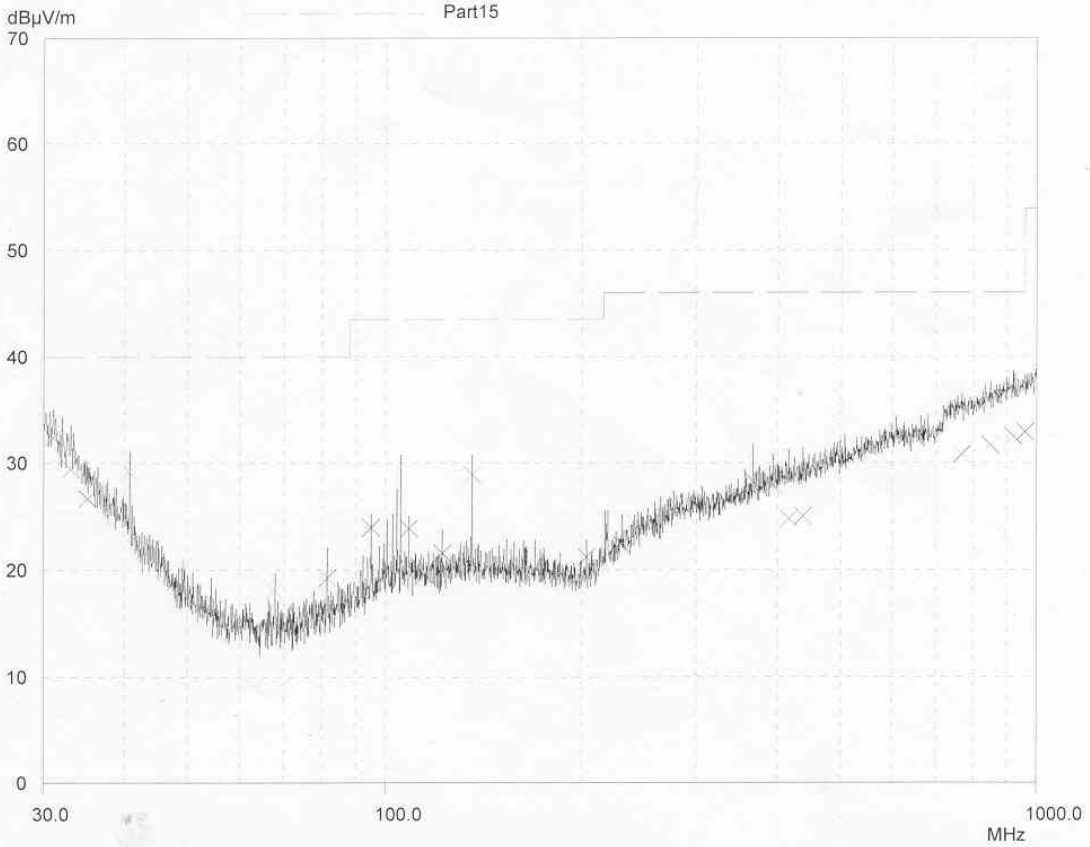
Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
30MHz	1000MHz	50kHz	120kHz	PK	1msec	Auto	ON	60dB

Transducer	No.	Start	Stop	Name
1	21	30MHz	1000MHz	UH72
	22	30MHz	1000MHz	UH93

Final Measurement:

Detector:	X QP
Meas Time:	2sec
Subranges:	50
Acc Margin:	10 dB



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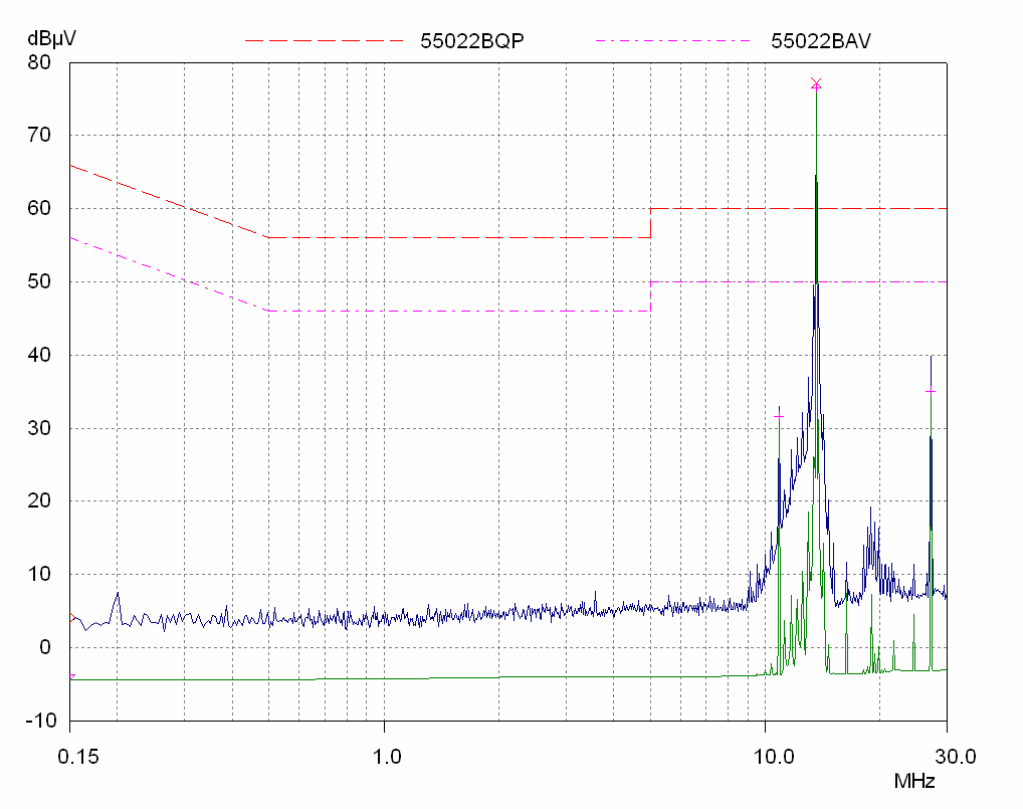
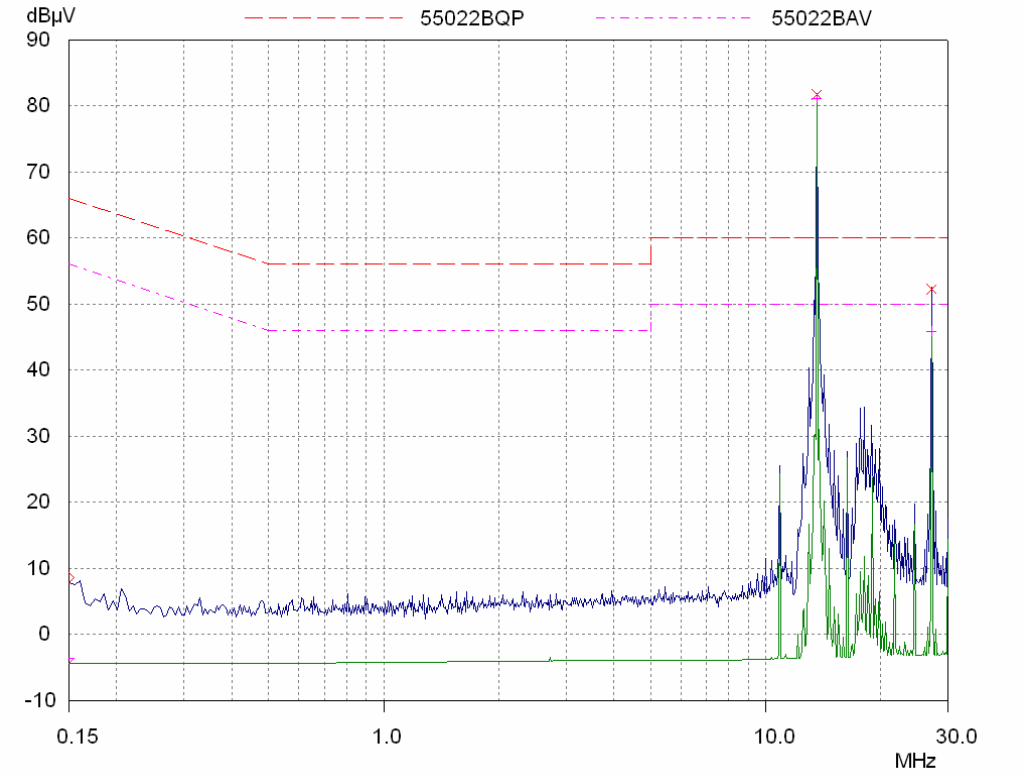
ANNEX F

POWERLINE CONDUCTION GRAPH(s)

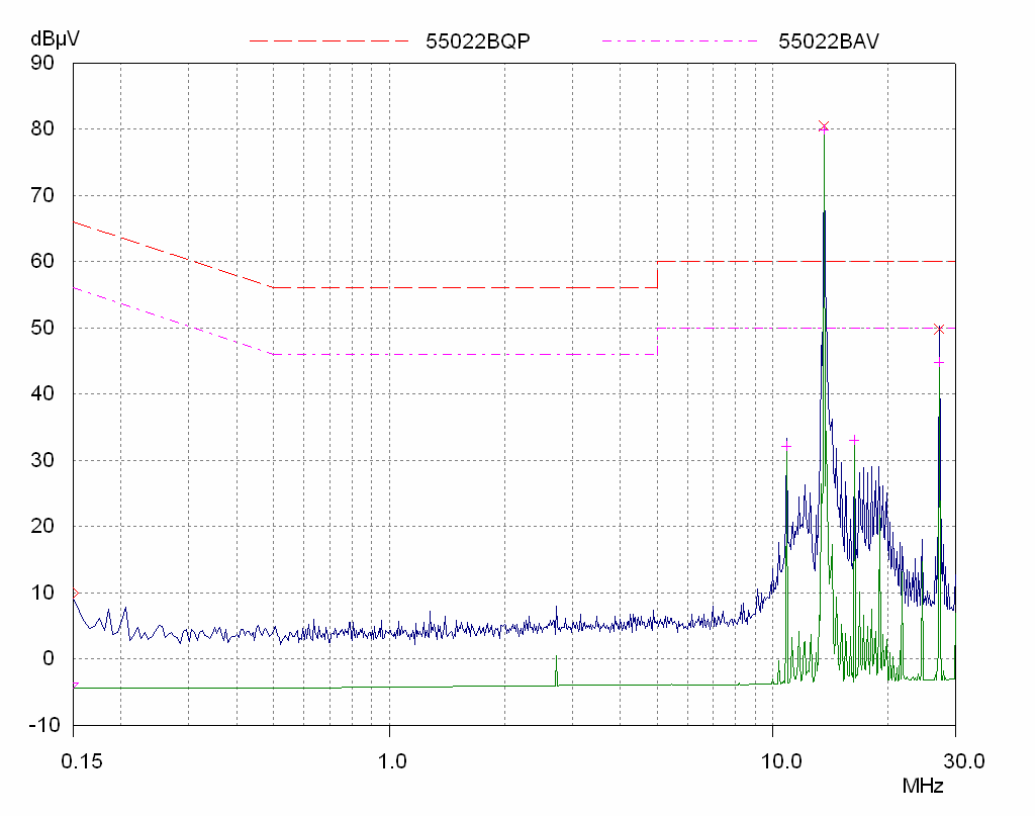
POWERLINE CONDUCTION ATTACHED ANTENNA



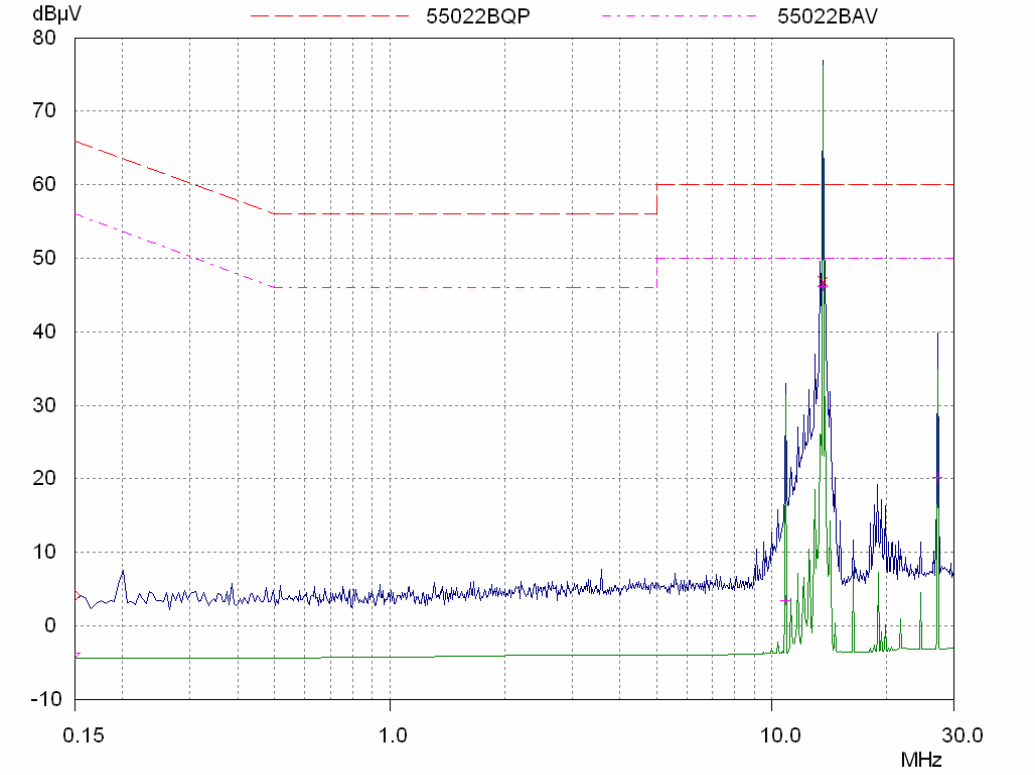
POWERLINE CONDUCTION REMOTE ANTENNA



POWERLINE CONDUCTION LARGE REMOTE ANTENNA

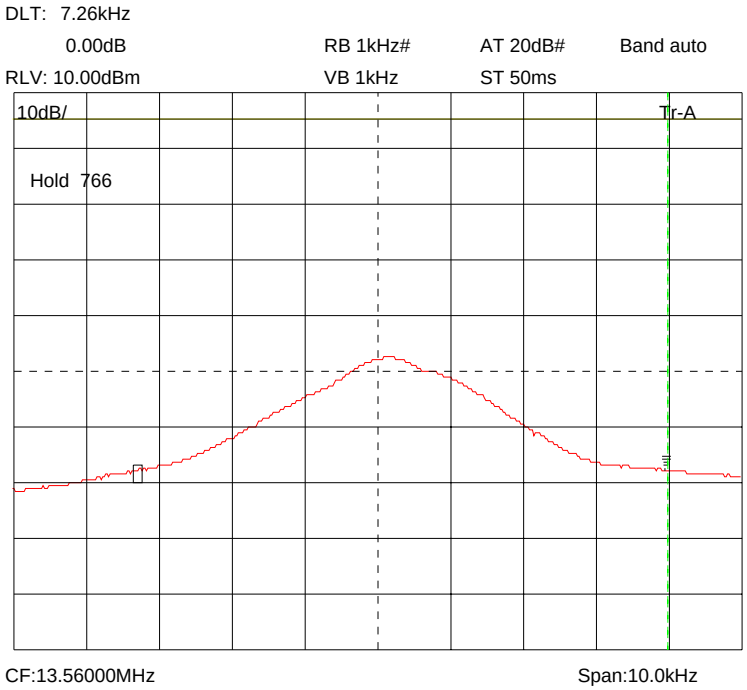


POWERLINE CONDUCTION DUMMY ANTENNA CONNECTED

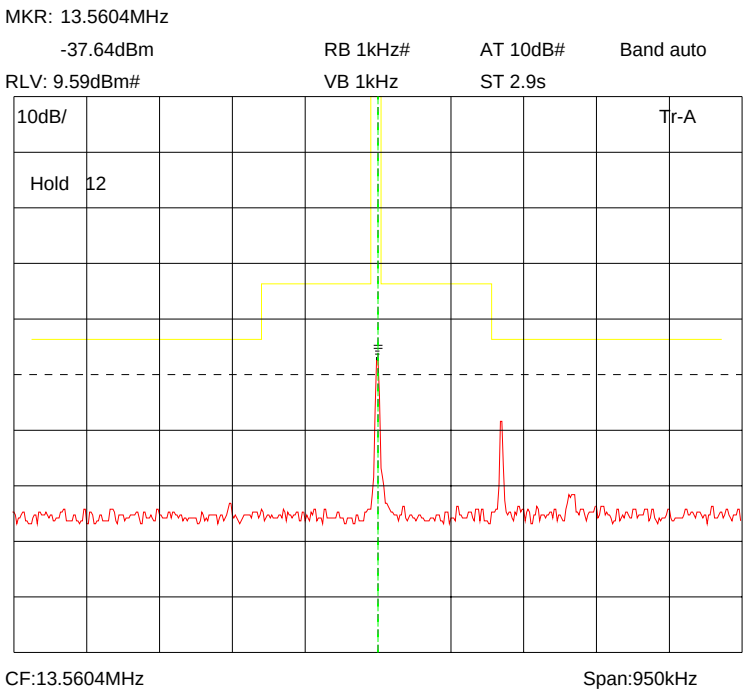


ANNEX G

EMISSIONS MASK COMPLIANCE



20 dB Bandwidth & Mask Close in



Full Mask Compliance